

## PCT REQUEST

Original (for SUBMISSION )

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| <b>0</b>       | <b>For receiving Office use only</b>   |  |
| <b>0-1</b>     | International Application No.  |  |
| <b>0-2</b>     | International Filing Date  |  |
| <b>0-3</b>     | Name of receiving Office and "PCT International Application"   |  |
| <b>0-4</b>     | <b>Form - PCT/RO/101 PCT Request</b>   |  |
| <b>0-4-1</b>   | Prepared Using   | PCT-SAFE [EASY mode]<br>Version 3.50 (Build 0002.150)                      |
| <b>0-5</b>     | <b>Petition</b><br>The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty |  |
| <b>0-6</b>     | Receiving Office (specified by the applicant)  | United States Patent and Trademark Office (USPTO) (RO/US)                  |
| <b>0-7</b>     | Applicant's or agent's file reference  | 5504-1167  |
| <b>I</b>       | <b>Title of Invention</b>  | TUNGSTEN-BASED ELECTROCATALYST AND FUEL CELL CONTAINING SAME               |
| <b>II</b>      | <b>Applicant</b>   |  |
| <b>II-1</b>    | This person is:  | applicant only   |
| <b>II-2</b>    | Applicant for  | all designated States except US  |
| <b>II-4</b>    | Name:  | OSRAM SYLVANIA INC.  |
| <b>II-5</b>    | Address:   | 100 Endicot Street<br>Danvers, MA 01923<br>United States of America        |
| <b>II-6</b>    | State of nationality   | US   |
| <b>II-7</b>    | State of residence   | US   |
| <b>II-8</b>    | Telephone No.  | 978-750-2312   |
| <b>II-9</b>    | Facsimile No.  | 978-750-2045   |
| <b>III-1</b>   | <b>Applicant and/or inventor</b>   |  |
| <b>III-1-1</b> | This person is:  | applicant and inventor   |
| <b>III-1-2</b> | Applicant for  | US only  |
| <b>III-1-4</b> | Name (LAST, First)   | CHRISTIAN, Joel B.   |
| <b>III-1-5</b> | Address:   | 37 Third Street<br>Towanda, Pennsylvania 18848<br>United States of America |
| <b>III-1-6</b> | State of nationality   | US   |
| <b>III-1-7</b> | State of residence   | US   |

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| IV-1   | <b>Agent or common representative; or address for correspondence</b><br>The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:  | <b>agent</b>  |
| IV-1-1 | Name (LAST, First)   | CASTEL, Benoit  |
| IV-1-2 | Address:   | c/o YOUNG & THOMPSON<br>745 South 23rd Street, Suite 200<br>Arlington, VA 22202<br>United States of America |
| IV-1-3 | Telephone No.  | 703-521-2297  |
| IV-1-4 | Facsimile No.  | 703-685-0573  |
| IV-1-5 | e-mail   | embon@young-thompson.com  |
| IV-1-6 | Agent's registration No.   | 35,041  |
| V      | <b>DESIGNATIONS</b>  |   |
| V-1    | The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents. |   |
| VI-1   | <b>Priority claim of earlier national application</b>  |   |
| VI-1-1 | Filing date  | 26 March 2003 (26.03.2003)  |
| VI-1-2 | Number   | 60/320,056  |
| VI-1-3 | Country  | US  |
| VI-2   | <b>Priority document request</b><br>The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):  | VI-1  |
| VII-1  | <b>International Searching Authority Chosen</b>  | United States Patent and Trademark Office (USPTO) (ISA/US)  |

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|             |  |                                   |                                    |
|-------------|--|-----------------------------------|------------------------------------|
| <b>VIII</b> | <b>Declarations</b>  | <b>Number of declarations</b>     |                                    |
| VIII-1      | Declaration as to the identity of the inventor   | -                                 |                                    |
| VIII-2      | Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent             | -                                 |                                    |
| VIII-3      | Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application | -                                 |                                    |
| VIII-4      | Declaration of inventorship (only for the purposes of the designation of the United States of America)                               | -                                 |                                    |
| VIII-5      | Declaration as to non-prejudicial disclosures or exceptions to lack of novelty   | -                                 |                                    |
| <b>IX</b>   | <b>Check list</b>  | <b>number of sheets</b>           | <b>electronic file(s) attached</b> |
| IX-1        | Request (including declaration sheets)   | 4                                 | -                                  |
| IX-2        | Description  | 9                                 | -                                  |
| IX-3        | Claims   | 2                                 | -                                  |
| IX-4        | Abstract   | 1                                 | ✓                                  |
| IX-5        | Drawings   | 4                                 | -                                  |
| IX-7        | TOTAL  | 20                                |                                    |
|             | <b>Accompanying Items</b>  | <b>paper document(s) attached</b> | <b>electronic file(s) attached</b> |
| IX-8        | Fee calculation sheet  | ✓                                 | -                                  |
| IX-17       | PCT-SAFE physical media  | -                                 | ✓                                  |
| IX-19       | Figure of the drawings which should accompany the abstract   | 1                                 |                                    |
| IX-20       | Language of filing of the international application  | English                           |                                    |
| X-1         | Signature of applicant, agent or common representative   |                                   |                                    |
| X-1-1       | Name:  | CASTEL, Benoit                    |                                    |
| X-1-2       | Name of signatory  |                                   |                                    |
| X-1-3       | Capacity   |                                   |                                    |

**PCT REQUEST**

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|--------|---|--------|
| 10-1   | Date of actual receipt of the purported international application   |        |
| 10-2   | Drawings:   |        |
| 10-2-1 | Received  |        |
| 10-2-2 | Not received  |        |
| 10-3   | Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application |        |
| 10-4   | Date of timely receipt of the required corrections under PCT Article 11(2)  |        |
| 10-5   | International Searching Authority   | ISA/US |
| 10-6   | Transmittal of search copy delayed until search fee is paid   |        |

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| 11-1 | Date of receipt of the record copy by the International Bureau |  |
|------|--|--|

**PCT (ANNEX - FEE CALCULATION SHEET)**Original (for **SUBMISSION**)

(This sheet is not part of and does not count as a sheet of the international application)

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| <b>0</b>     | <b>For receiving Office use only</b>  |   |                     |
| <b>0-1</b>   | International Application No.   |   |                     |
| <b>0-2</b>   | Date stamp of the receiving Office  |   |                     |
| <b>0-4</b>   | <b>Form PCT/RO/101 (Annex)</b>  |   |                     |
| <b>0-4-1</b> | PCT Fee Calculation Sheet Prepared Using  | PCT-SAFE [EASY mode]<br>Version 3.50 (Build 0002.150)     |                     |
| <b>0-9</b>   | Applicant's or agent's file reference   | 5504-1167   |                     |
| <b>2</b>     | Applicant   | OSRAM SYLVANIA INC.                                       |                     |
| <b>12</b>    | <b>Calculation of prescribed fees</b>   | fee amount/multiplier                                     | Total amounts (USD) |
| 12-1         | Transmittal fee T   | ⇒   | 300                 |
| 12-2-1       | Search fee S  | ⇒   | 1000                |
| 12-2-2       | International search to be carried out by   | US  |                     |
| 12-3         | International filing fee (first 30 sheets) I1   | 1035  |                     |
| 12-4         | Remaining sheets  | 0   |                     |
| 12-5         | Additional amount (X) 0   |   |                     |
| 12-6         | Total additional amount I2  | 0   |                     |
| 12-7         | I1 + I2 = I   | 1035  |                     |
| 12-12        | EASY Filing reduction R   | -74   |                     |
| 12-13        | Total International filing fee (I-R) I  | ⇒   | 961                 |
| 12-14        | Fee for priority document   |   |                     |
|              | Number of priority documents requested  | 1   |                     |
| 12-15        | Fee per document (X) 20   |   |                     |
| 12-16        | Total priority document fee: P  | ⇒   | 20                  |
| 12-17        | <b>TOTAL FEES PAYABLE (T+S+I+P)</b>   | ⇒   | 2281                |
| 12-19        | Mode of payment   | authorization to charge deposit account                   |                     |
| 12-20        | Deposit account instructions  |   |                     |
|              | The receiving Office  | United States Patent and Trademark Office (USPTO) (RO/US) |                     |
| 12-20-1      | Authorization to charge the total fees indicated above.   | ✓   |                     |
| 12-20-2      | Authorization to charge any deficiency or credit any overpayment in the total fees indicated above. | ✓   |                     |
| 12-20-3      | Authorization to charge the fee for priority document.  | ✓   |                     |
| 12-21        | Deposit account No.   | 25-0120   |                     |
| 12-22        | Date  | 25 March 2004 (25.03.2004)                                |                     |
| 12-23        | Name and signature  | CASTEL, Benoit  |                     |

The catalyst of this invention is a non-stoichiometric tungsten compound,  $H_{0.53}WO_3$ , which may be used as both the anode and cathode electrocatalyst for acid-style low-temperature fuel cells. A fuel cell using the tungsten-based electrocatalyst as both the anode and cathode has been constructed and operated with a hydro fuel and an air oxidant.